

Oconee Nuclear Station Units 1, 2, 3 SLRA TRP 149.4

Breakout Audit Questions

TLAA Section 4.7.4 Leak-Before-Break Analysis for Reactor Coolant System Piping

| # | SLRA Section | SLRA Page | Question / Issue | Why are we asking? |
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| 1 | 4.7.4 | 17 of Framatome Document No. 51-5000709-002 "Assessment of TLAA Issues in LBB Analysis of RCS Primary Piping" | SRP 3.6.3 Rev.1 (dated 2007) states that Primary Water Stress Corrosion Cracking (PWSCC) is considered to be an active degradation mechanism in Alloy 600/82/182 materials in PWR's. Section 4.1 of Framatome Document No. 51-5000709-002 "Assessment of TLAA Issues in LBB Analysis of RCS Primary Piping," states the RCS primary piping is primarily constructed from carbon steel which has been clad with austenitic stainless steel or Alloy 82/182. Please identify how the applicant is demonstrating that PWSCC is not a potential source of pipe rupture as required in SRP 3.6.3 Rev.1. | SRP 3.6.3 of NUREG-0800 states that PWSCC is considered to be an active degradation mechanism in Alloy 600/82/182 materials in PWR's and needs to be addressed. |
| 2 | 4.7.4 | 75 | In the TLAA, it states that the fatigue flaw growth evaluations are based on transients defined by ONS UFSAR Table 5.2, Transient Cycles for RCS components Except Pressurizer Surge Line. It states that these transients are monitored by the Fatigue Monitoring Program (Section B3.1, Gall – SLR X.M1) and provides an acceptable method for managing the fatigue flaw growth aspect of the LBB evaluation | The TLAA states that transient cycles are monitored for RCS components, but there is no mention how the Pressurizer Surge Line is monitored. |

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| | | | for the SPEO. How is the pressurizer surge line monitored? | |
| 3 | 4.7.4 | 77 | In the TLAA, it states that the subsequent data published in NUREG/CR-6177, "Assessment of Thermal Embrittlement of Cast Stainless Steels" indicate that prolonged exposure of CASS to reactor coolant operating temperature can lead to reduction of fracture toughness by thermal embrittlement. Therefore, a Flaw Stability Analysis (FSA) using the lower-bound CASS fracture toughness curves from NUREG/CR-6177 was used to demonstrate the acceptability of LBB of CASS items for the RCS for the SPEO. Please state the results of the FSA and if indeed it is bounding to the SPEO. Please expand on the TLAA Evaluation for the CASS items which were screened out. | TLAA needs to close the loop on the analysis. |
| 4 | 4.7.4 | | On page 77, the third paragraph of the page states that the ONS 2 and 3, the discharge and suction nozzles of the RCP casings were evaluated for LBB using the heat specific fracture toughness curves per NUREG/CR-4513, Revision 2. It was previously stated that the assumptions in BAW-1847 Rev. 1, that the fracture toughness of the ferritic piping and ferritic weldments bounding the fracture toughness of CASS materials cannot be supported. Therefore, for the | Why was it determined that in support of SLR for 80years of operation, the most recent fracture toughness data from NUREG/CR-4513, Rev. 2 was evaluated and determined to be limiting compared to the NUREG/CR-6177 fracture toughness data for the specific RCP material heats |

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| | | | <p>SPEO for 60 years, an FSA was performed using the lower-bound CASS fracture toughness curves from NUREG/CR-6177 to show acceptability of LBB.</p> | <p>evaluated? What changed to make the fracture toughness data more limiting for NUREG/CR-4513? Please provide clarification.</p> |
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